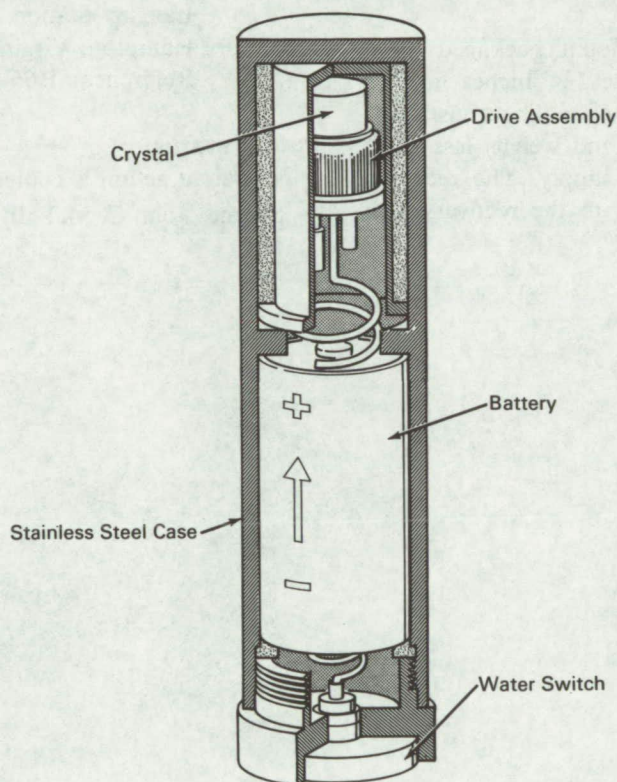


# NASA TECH BRIEF



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## System Locates Randomly Placed Remote Objects



### The problem:

The precise location of objects submerged underwater. To be effective the location system must be simple to operate, extremely rugged, corrosion resistant, have long operating life, low maintenance requirement, be easily portable, and furnish a precise bearing on the object to be recovered at ranges from a few inches to three nautical miles.

### The solution:

A location system utilizing active/passive sonar techniques in which the active element (a transmitter) is attached to the object to be recovered and the passive element (a receiver) is used for search from either a surface craft or by SCUBA equipped divers.

### How it's done:

The transmitter attached to the object to be re-

(continued overleaf)

covered is activated upon a planned event such as water entry and continues to transmit an omnidirectional pulse sound at a frequency of about 38 kc for a period of about 500 hours. The receiver is highly sensitive to pointing direction and is used first over the side of a surface craft on a rod which is rotated by the operator to determine a bearing from the maximum audio signal in the receiver. Upon signal detection, the receiver bearings are followed until the surface craft passes over the object to be recovered (easily detectable by bearing reversal). The receiver head is then removed from the rod and mounted on the handheld receiver for use by a SCUBA equipped diver. The diver proceeds to the object by following bearings obtained in pointing the handheld receiver toward the transmitter attached to the object.

**Notes:**

1. The transmitter is shock mount packaged in a cylindrical stainless steel case  $1\frac{1}{4}$  inches in diameter with a length of  $3\frac{3}{4}$  inches. The transmitter is completely self-contained and weighs less than 10 ounces including power supply. The receiver system is easily handcarried to the recovery site in a small instrument case.

2. Numerous applications have been made of this location system in recovery systems for research payloads; in addition, the system has been used in booster recovery, position marking, aircraft data recorder recovery, maintenance of security in military applications, back up recovery mode in drop tests, camera pod recovery, and radiation source payload recovery system. Potential applications are being explored in the area of deep ocean retrieval, weapons systems, water transportation of dangerous chemical and gases, commercial and military aircraft.
3. Inquiries concerning this invention may be directed to:

Technology Utilization Officer  
Langley Research Center  
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Reference: B66-10315

**Patent status:**

No patent action is contemplated by NASA.

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